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S/N: 10/604,597

In the Claims

What is claimed is:

1. (Original) A method of diffusion weighted MR imaging comprising the steps of:
for each echo train, splitting MR data acquisition into non-parallel odd and even echo acquisition blades;
for each echo train, rotating the odd and even acquisition blades of data acquisition about an origin point with respect to a previous acquisition; and
combining data collected from each odd and even data acquisition blades into a composite set of MR data for reconstruction.
2. (Original) The method of claim 1 comprising the step of collecting each blade of MR data with a separate transmit and receive coil.
3. (Original) The method of claim 2 further comprising the step of phase correcting selected MR data to remove spatially varying phase differences between refocusing pulses applied to induce each echo train and the receive coil.
4. (Original) The method of claim 3 further comprising the step of phase correcting the collected MR data to remove spatially varying differences resulting from application of diffusion weighting gradients.
5. (Original) The method of claim 1 wherein the origin point is positioned in a center of k-space and the odd and even acquisition blades of a given acquisition are rotated with respect to one another.
6. (Original) The method of claim 1 wherein each blade is similarly sized.
7. (Original) The method of claim 1 wherein each blade has a width equal to one-half a width of a composite blade of the two separate blades of data acquisition.
8. (Original) The method of claim 1 further comprising the step of applying a fast spin echo-diffusion weighted imaging pulse sequence to acquire each blade of data acquisition.

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9. (Original) An MRI apparatus comprising:
a magnetic resonance imaging (MRI) system having a plurality of gradient coils positioned about a bore of a magnet to impress a polarizing magnetic field and an RF transceiver system and an RF switch controlled by a pulse module to transmit RF signals to an RF coil assembly to acquire MR images; and
a computer programmed to:
segment acquisition of each echo train into an odd section and an even section, wherein each odd and even section extends through an origin point;
acquire a segment of MR data;
rotate each segmented acquisition a prescribed interval about the origin point for each subsequent acquisition;
combine MR data from corresponding odd and even sections into a composite set of MR data; and
reconstruct an image from the composite set.
10. (Original) The MRI apparatus of claim 9 wherein the computer is further programmed to phase correct the MR data for each odd and even section.
11. (Original) The MRI apparatus of claim 9 wherein the computer is further programmed to imitate a fast spin echo-diffusion weighted imaging pulse sequence to acquire data for each odd and even section.
12. (Original) The MRI apparatus of claim 9 wherein the origin point includes a center of k-space.
13. (Original) The MRI apparatus of claim 12 wherein each section includes a rectangular strip of k-space extending through the center of k-space.
14. (Original) The MRI apparatus of claim 9 further comprising a transmit RF coil configured to transmit an RF pulse toward a subject and a receive RF coil configured to receive signals from the subject for processing into MR data suitable for image reconstruction.
15. (Original) The MRI apparatus of claim 9 wherein each section is similarly sized.

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16. (Original) A computer readable storage medium having stored thereon a computer program comprising instructions which when executed by a computer cause the computer to:

for each echo train, segment data acquisition into an odd data acquisition and even data acquisition;

associate a strip of k-space extending through a center of k-space for each data acquisition;

rotate the strip of k-space for the odd data acquisition and the even data acquisition for each subsequent echo train; and

combine parallel strips of data collected for each odd and even acquisition into a composite set of MR data for image reconstruction.

17. (Original) The computer readable storage medium of claim 16 wherein the set of instructions further causes the computer to phase correct each strip of k-space data.

18. (Original) The computer readable storage medium of claim 16 wherein each strip of k-space includes multiple k-space lines.

19. (Original) The computer readable storage medium of claim 16 wherein each odd acquisition includes a strip of k-space spaced 90° from that for each strip of an even acquisition.

20. (Original) The computer readable storage medium of claim 16 wherein the set of instructions further causes the computer to initiate a fast spin echo imaging sequence to acquire each strip of k-space data.